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THE PLACE OF FIXATION IN THE TRACTION TREATMENT OF HIP DISEASE.*

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I do not come among you with the purpose of bringing up the never-ending question whether hip disease is best treated by traction or fixation, but, as a believer in the treatment by traction, to discuss simply the place which fixation should occupy in that treatment, to consider whether apparatus should aim only at producing traction, or whether it should have as its object to fix the joint as well. It seems to me that these are pertinent questions to those who are treating hip disease by ambulatory methods.

It seems, moreover, that these are pertinent questions if, as I hope to show, the defect of our present treatment lies in the incomplete fixation which it affords to many diseased hip joints. To those who believe in the traction

* Read before the Section in Orthopædic Surgery of the New York Academy of Medicine, April 17, 1891.

treatment it is incumbent to perfect, so far as may be, that method.

The subject seems to divide itself into two heads:

(*a*) The question of the advisability of using in certain cases a splint which shall give better fixation than the long traction splint, and the consideration of the class of cases in which this is advisable.

(*b*) The indications for bed fixation, and the class of cases in which this is necessary, and what is to be expected from its use.

There is no question that the American traction splint now in common use in this country was first introduced as an appliance which should give "passive motion without friction." It was not regarded at that time as a fixative appliance. Dr. Sayre spoke of it as "a plan by which extension could be maintained that would remove pressure from the acetabulum and the head of the femur, and at the same time permit motion of the joint." Dr. C. F. Taylor stated the object of the splint to be, "first, to relieve the pressure of the joint due to the muscular contraction by temporarily destroying the muscular irritability and contractility, and, secondly, to protect the joint from weight and concussion." No mention is made of it by him as a fixative appliance, and he adds that the indication for arresting motion in the joint, which is well met by the gypsum bandage and similar expedients, pertains only to a condition of rigid muscular contraction. In short, he did not mention fixation as an attribute of the splint.

Subsequently, however, traction came to be regarded as a means of fixation, and Dr. Judson * quoted such authority as Shaffer, Yale, Wyeth, Bauer, and others, as upholding the view that the long traction splint afforded fixation to the

* *Med. Rec.*, July 7, 1883.

hip joint. But, as he says in the following paragraph of his admirable essay, "the fixation of the hip joint is one of the most difficult problems in mechanical surgery."

Two years ago I had the pleasure of reporting to the American Orthopædic Association some experiments which were made with a view to determining the practical fixation furnished to the hip joint by a long traction splint properly applied, and the little that they show must, it seems to me, be accepted as demonstrating that the long traction splint is in no sense a fixative appliance.

In these experiments a long-traction splint was fitted with a self-registering pencil, by means of which motion at the hip joint was recorded upon the skin over the ilium. This was done simply by carrying the shaft up, so that it held the pencil perpendicularly to the skin. A splint fitted with this register was applied to a boy with normal hip joints, and traction was made up to the usual point, being about three pounds and a half, as registered by a spring balance inserted in the extension straps. With this splint on, the boy was allowed to walk, and it was found that the hip described an arc of thirty-five degrees of joint motion. In sitting down and rising, an arc of similar extent was described. In another case with normal hip joints the motion was found greater, and the register showed a motion of forty degrees. With a very severe amount of traction—so much so that it was almost unendurable—motion of fifteen degrees was recorded. This apparatus was first tested by being applied to a patient with ankylosis of the hip, when it was found that no motion was recorded, the register marking by a dot.

These experiments certainly seem to show that to a healthy hip joint the long traction splint affords very imperfect fixation, and it may be inferred that to a diseased joint equally poor support is afforded.

The question then arises, Is this a matter of any practical importance, and is not the fixation furnished sufficient?

There seems but little question that in mild hip disease, where joint motion is allowed in a fairly wide arc, motion within the limits of that arc is not harmful.

Dr. C. F. Taylor believed that "motion in the joint without pressure is not only not injurious, but beneficial," and Dr. Shaffer, in his recent classical essay on the mechanical treatment of hip disease, says: "If the disease permits a certain amount of motion at the affected articulation, motion within the limit set by Nature is not harmful."

But it must be evident that it is practically a difficult matter to allow joint motion and to check it at the point where harm begins with an appliance which allows thirty degrees or more of joint motion.

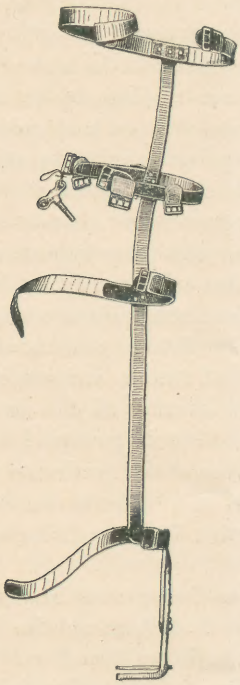
I think every one will agree with me that a certain proportion of cases of hip disease do not progress well under treatment with the long traction splint.

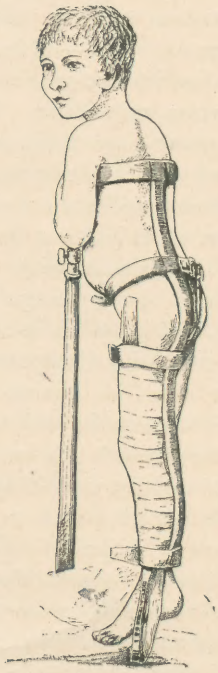
These cases seem to be of two sorts: First, those where the disease is very severe, and, secondly, those where the splint does not afford sufficient protection to the diseased joint on account of the patient's constant and harmful activity. Many patients who come under my observation at least are allowed by their parents to go about all day, and to play as much as they choose. With their traction splints on they climb fences, run races, and play rough games, and in these cases it is a common experience to find that there is little motion at the joint, and that it tends to grow less rather than more. Such joints generally become sensitive and tend to malposition, and this sensitiveness is in a way a protection, because it necessitates rest, and with rest comes improvement in the sensitiveness, and probably an increase of joint motion. With the im-

provement, the activity begins again, and with the fresh misuse of the limb the sensitiveness and the malposition are likely to return, and the same circle to be gone over and over again, until probably an abscess or some more serious condition is developed. It is therefore for this reason that, in such cases, it seems advisable to limit if possible the joint motion that has been demonstrated to be allowed by the traction splint—in the first place, in the hope of shortening the disease, and, in the second place, in the hope of preventing malposition. I have assumed that malposition occurs more often as the result of undue activity and joint traumatism. Certainly, the rapidity with which malposition disappeared under the simplest treatment of rest and joint fixation would lead one to infer that their appearance was caused by undue activity. Moreover, it must come into the experience of every surgeon that, even without confinement to bed, restriction of the activity of these patients will very often cause the disappearance of such a malposition. In certain cases, of course, the severity of the disease is enough to cause the malposition, but in general, I think, it will coincide with the experience of the gentlemen present to state that the malposition is in most cases the result of imperfect control and to motion in the joint beyond the limit set by Nature.

It stands to reason that the disease must be prolonged by such exacerbations as those described, and the deposit of inflammatory material must be larger than it would be if these causes of irritation were avoided. Certainly such cases as these are very common in every hospital clinic, and any means which would make their number less must appeal to those who believe in ambulatory traction treatment. It is, therefore, for these cases, and cases where the disease is of unusual severity in the beginning, that I would plead for more fixation in connection with the ambulatory treat-

ment. In the hope of doing something to further this end, I have to show a splint which has been very useful in preventing joint traumatism by furnishing better fixation to the hip than is afforded by the ordinary splint.





I showed a similar splint at the Congress of Physicians and Surgeons in 1888, but it lacked one very important feature which this splint possesses—namely, a pelvic band.

The splint consists practically of a combination of the

Taylor and the Thomas splints, and should be bent to fit the curve of the back accurately. It secures a hold on the thorax by the upper hinged piece, it has the hip band of a Taylor splint, with two perineal bands, and the leg piece is in a measure like the Thomas splint again, except that it is prolonged beyond the foot to end in a traction apparatus. The splint does not attempt to force the leg into position by using the lever principle, and for this reason it is curved to fit the back. It simply aims at making traction, and while doing this it fixes the hip as much as can be done by any portative appliance.

The splint without the pelvic band failed to hold the pelvis as it should, and it was possible for the buttock and pelvis to slip away from its grasp; but this splint is definite in its support, and holds the leg, pelvis, and thorax with no uncertain hold.

The splint is heavy and cumbersome and makes it awkward for the patient when he attempts to sit down. It is uncomfortable inasmuch as it necessitates the constant use of crutches and a high shoe on the other foot, but these disadvantages are all accompaniments of hip fixation, and it must be evident that this splint, if properly fitted, is likely to afford much better fixation to the joint than any splint which ends at the pelvis.

I am far from wishing to advocate the routine application of this splint. In private practice it would be of little use, but it does seem to me that in the large clinics, where the patients are not under good control, the results would be better if some splint of this sort were applied in the cases which seemed of decided severity, and in average cases where the parents seemed to have poor control over their children.

Personally I use it in out-patient practice in cases where sensitiveness of the hip is present to any extent, where

the temperature is high, or where there is much induration of the soft parts; in short, in that whole class of cases which one characterizes unscientifically as "bad cases."

In addition to these cases, in those where the children are unruly and disobedient and the parents evidently shiftless and easy-going, I apply the splint without much regard to the severity of the disease, believing that it is better to err on the side of affording too much fixation rather than too little.

In short, the long traction splint does not fix the hip joint, and when used it should be borne in mind that it allows motion at the hip, perhaps within the limits set by Nature, perhaps beyond those limits.

The second division of the subject can be discussed more briefly. Fixation in bed seems advisable when sensitiveness occurs in the joint, or malposition of the limb begins to appear. I make this statement on the ground of the experience at the Boston Children's Hospital, where this policy has been pursued very carefully for several years. The success of this method of treatment has been so marked that each year has shown an increase in the number of cases admitted.

In 1888, 42 cases of hip disease were admitted to the ward; in 1889, 59 cases; in 1890, 81 cases.

In these years the percentage of cases admitted for deformity and sensitiveness has steadily increased, and the percentage of cases admitted for abscess has steadily diminished. Of the 182 patients admitted in these three years (which are all that it has been possible to analyze), 107 were admitted for deformity or sensitiveness, and stayed only a short time in the hospital, returning to the out-patient department for ambulatory treatment, while only 54 cases were admitted for abscess and 23 for application of apparatus.

I am indebted to Dr. J. E. Goldthwait for invaluable assistance in collecting these and my other figures.

It has seemed to those of us who have had the opportunity to observe these cases that, had the admission of the sensitive cases been longer delayed, the proportion of abscesses would have been distinctly larger, and it is to our figures with regard to the occurrence of abscess that I would particularly call your attention.

The percentage of abscesses in the class of cases treated in this way is surprisingly small. From 1884 to 1890, inclusive, there presented themselves at the Out-patient Department of the Children's Hospital 574 new cases of hip disease. In pursuance of the operative treatment of these abscesses which we have followed out for some years, practically all cases of abscesses were admitted to the hospital as soon as they appeared. In those years when 574 new cases appeared at the Out-patient Department, 107 abscesses were opened in the hospital, which means that 107 cases either had an abscess at the time of coming or developed it in the course of the disease. This gives a percentage of 18·7 per cent., which is very much lower than in any other series of cases reported. There may be a slight error, amounting to 1 or 2 per cent., caused by exceptional cases of abscesses which were not operated upon, but these were so few that they would make very little difference in the percentage.

This low rate of abscesses becomes very striking when one considers it in comparison with the similar groups of reported cases. In the 80 cases reported by Dr. Gibney in 1878, 60 per cent. had abscess; in the Clinical Society's report, 69 per cent. had abscess; and even in the recent cases of Mr. Marsh from the Alexandra Hospital, covering nearly the same years as those which I report now, 50 per cent. developed abscesses.

It is, of course, to be assumed on this basis that the malposition is to be regarded as a precursor of abscess, and that, by treatment of the malposition as soon as it appears, the occurrence of abscess is prevented in a very large number of cases. Certainly the figures which I have presented to you to-night justify me making the statement that this is to be regarded as the preventive treatment of abscess. It has been possible to investigate the 37 abscesses operated on in 1889 and 1890 with regard to the coexistence of deformity.

Of the 37 abscesses operated on in 1889 and 1890, 5 were not accompanied by any deformity of the limbs (in 5 the notes were imperfect), while in 27 there was present marked or severe malposition of the limb.

It therefore seems that the adoption of fixation in bed is to be advocated when malposition occurs, on the ground not only of curing the malposition, but on the supposition that it serves to prevent the occurrence of abscess in a very large proportion of cases, and in that way to avoid one of the most troublesome and uncomfortable complications of the disease.

In summing up, it may be said that the order of events seems to be this: Imperfect joint fixation allows joint motion beyond the limits set by Nature and malposition of the limb occurs, which is the expression of joint irritability.

It is desirable to prevent this, if possible, by better fixation; but, if it has occurred, it should be treated at once by rest in bed, to prevent its passing on to the stage of abscess formation.

I have not, I fancy, added anything to the literature of hip disease, or brought forward anything that is new. I hope that I have succeeded in calling your attention to the fact that the traction splint in common use is not a fixation

splint, and that in certain cases better fixation would be desirable in ambulatory treatment, and perhaps the splint shown may be of use in this direction. It seems to me that the more important fact which has been discussed is the extreme importance of the immediate treatment of joint sensitiveness or malposition by temporary rest in bed, with traction in the line of the deformity.

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